Klimatologie vertikálního teplotního gradientu ve spodní a střední troposféře

Climatology of temperature lapse rate in the lower and middle troposphere

Abstract

The main objective of this thesis is synoptic-climatological analysis of the temperature lapse rate (γ) in the lower and middle troposphere above the boundary layer at mid-latitudes of the northern hemisphere. The main part of the background research summarizes current knowledge about the mechanism of air temperature change with altitude, the effect of water vapour on γ, and stability conditions in the atmosphere. Radiation and net radiation are discussed to be one of the key factors influencing the behaviour of γ. The following chapter is summarizing findings about temporal and spatial variability of γ. The analysis of γ calculated from 850 and 300 hPa radiosounding data from Praha-Libuš is the core of this thesis. Results were used to describe annual variation of γ. Daily variation was not observed at this altitude. Further, the relationship of γ with air flow direction and Hess-Brezowsky synoptic types was analysed. The results show that the air flow direction and the synoptic situations together with the radiation and the humidity of atmosphere influence the value of γ. Based on the analogous analysis of γ in Poprad-Gánovce were results from Prague-Libuš largely confirmed.

Keywords: temperature lapse rate, synoptic classification, free atmosphere